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09/846,058	04/30/2001	Jay K.. Bass	10004190-1	4485

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AGILENT TECHNOLOGIES INC
LEGAL DEPARTMENT,DL429
INTELLECTUAL PROPERTY ADMINISTRATION
P.O. BOX 7599
LOVELAND, CO 80537-0599

EXAMINER

EPPERSON, JON D

ART UNIT	PAPER NUMBER
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1639

DATE MAILED: 07/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/846,058

Applicant(s)

BASS ET AL.

Examiner

Jon D Epperson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 and 27-38 is/are pending in the application.
- 4a) Of the above claim(s) 10-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 27, 28, 30 and 32-38 is/are rejected.
- 7) ☒ Claim(s) 29 and 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Status of the Application

1. The Response filed April 26, 2004 is acknowledged.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Status of the Claims

3. Claims 1-26 were pending. Applicants amended claims 1, 4, 5 and 8 (e.g., see 4/13/04 and 4/26/04 Responses). In addition, Applicants canceled claims 24-26 and added claims 27-38. Therefore, claims 1-23 and 27-38 are currently pending.
4. Claims 10-23 are drawn to non-elected species and/or inventions and thus these claims remain withdrawn from further consideration by the examiner, 37 CFR 1.142(b), there being no allowable generic claim.
5. Therefore, claims 1-9 and 27-38 are examined on the merits in this action.
6. **Please note:** This application contains claims 10-23 drawn to a nonelected invention(s). This was addressed in the previous action (e.g., see Paper No. 6). A complete reply to the final

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rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01.

Withdrawn Objections/Rejections

7. With respect to the rejections under the second paragraph of 35 U.S.C. 112, the rejections denoted A and C-E are withdrawn in view of applicant's amendments to the claims and/or cancellation of claims. All other rejections are maintained and the arguments are addressed below.

Outstanding Objections and/or Rejections

Claims Rejections - 35 U.S.C. 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Withdrawn.

B. **Claim 1** recites the limitation "the chemical moieties" in the first line of step (b).

There is insufficient antecedent basis for this limitation in the claim. Therefore, claim 1 and all dependent claims are rejected under 35 USC 112, second paragraph.

C. Withdrawn.

D. Withdrawn.

E. Withdrawn.

Response

9. Applicant's arguments directed to the above 35 U.S.C. 112, second paragraph rejections were fully considered (and are incorporated in their entirety herein by reference) but were not deemed persuasive for the following reasons. Please note that the above rejection has been modified from its original version to more clearly address applicants' newly amended and/or added claims and/or newly amended arguments.

Applicants argue that "chemical moieties" are recited in the preamble and, as a result, the specification does provide proper antecedent basis.

This is not found persuasive for the following reasons:

The Examiner contends that the preamble recites "different chemical moieties", which does not provide the proper antecedent basis for "the chemical moieties" in step (b). This rejection may be overcome by reciting adding the word "different" before "chemical moieties."

Accordingly, the 35 U.S.C. 112, second paragraph rejections cited above are hereby maintained.

Claims Rejections - 35 U.S.C. 102

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-9, 27, 30, 32-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Indermuhle et al. (US Patent Application Publication 2001/0036674 A1) (Filed on **February 23, 2001**).

For *claims 1, 8-9, 27*, Indermuhle et al. (see entire document) disclose methods for making and using “pillar” biochips including the use of “elongated” pillars (see Indermuhle et al., abstract; see also figures 24-25), which anticipates claim 1. For example, Indermuhle et al. disclose determining the identity of a first direction across the substrate surface along which the substrate surface has a higher height uniformity than along a second direction across the substrate wherein said first and said second directions are planar to said planar substrate (e.g., see Indermuhle et al., figure 24). For example, the top of element 132 in figure 24 displays a rectangle wherein a direction that is parallel to the longer edge of the rectangle (i.e., a first direction, called the x-axis) has a higher height uniformity than a direction that is parallel to the shorter edge of the rectangle (i.e., a second direction, called the y-axis). Here, both directions (i.e., the x- and y-axis) are in the plane of the substrate, but the x-axis has higher height uniformity because the top of

the rectangular pillar extends almost continuously across the entire length of the substrate. In contrast, the y-axis (or the second direction) extends across many pillars (e.g., nine pillars are shown in the figure), spaces that separate the pillars (e.g., the substrate upon which the pillars rest), and many channel defining walls. Thus, the “height” is less uniform proceeding along the y-axis than the x-axis because the height changes from [1] pillar (i.e., element 132) to [2] space between the pillars (i.e., element 134) to [3] the channel defining wall elements (i.e., element 135). In addition, the first direction (i.e., the x-axis) and second direction (i.e., the y-axis) have been “compared” because the addition of sample is placed only on the “tops” of the pillars (i.e., placement is in the x-direction). That is, Indermuhle et al. did not intend to place the sample along the y-direction because that would lead to the placement of samples in the spaces between the pillars and also on top of the channel defining walls, which would defeat the purpose of making chips with elevated sample surfaces). In addition, Indermuhle et al. disclose placing chemical moieties on the substrate so as to provide features thereon along rows more closely aligned with the first direction than the second direction (e.g., see Indermuhle et al., figure 24, wherein element 133 is used to “dispense” chemical on the top of the elongated pillars that are parallel i.e., closely aligned to the first direction; see also page 2, column 2, paragraph 44 which discloses numerous chemical moieties that can be deposited on the pillar e.g., antibody/antigen, enzyme/substrate, etc.). Finally, Indermuhle et al. disclose the fabrication of an array of multiple features of different chemical moieties on the substrate surface (e.g., see Indermuhle et al., figure 24 disclosing the array of pillars on the surface wherein various chemicals are spotted on

said surface; see also page 2, column 2, paragraph 44; see also figures 2-4; see also page 3, column 2, paragraph 55). Also note that the “first” and “second” directions are perpendicular to the edges of the substrate (i.e., they are perpendicular to each other).

For *claim 2*, Indermuhle et al. disclose biopolymers in including proteins, DNA and carbohydrates (e.g., see Indermuhle et al., page 2, column 2, paragraph 44).

For *claim 3*, Indermuhle et al. disclose measuring the thickness of the substrate at different positions (e.g., see Indermuhle et al., figure 24 wherein the thickness of the substrate is measured at each element 132 in order to fit this protrusion within the dispenser at each element 133).

For *claims 4 and 32-33 and 35*, Indermuhle et al. disclose receiving a substrate from a remote location (e.g., see Indermuhle et al., figure 24, elements 130 and 133 wherein dispenser 133 is the remote location). Indermuhle et al. further disclose receiving from a remote location in association with the substrate, an identification of a first direction across the substrate surface along which the substrate surface has a higher height uniformity than along a second direction across the substrate, wherein said first and second directions are planar to said substrate (e.g., see claim 1 above; see also Indermuhle et al., figure 24 wherein element 132 fits into or is “identified” or “recognized” by element 133 at each position on the substrate and this recognition is based on “shape”). In addition, Indermuhle et al. disclose placing chemical moieties on the substrate so as to provide features thereon along rows more closely aligned with the first direction than the second direction (e.g., see Indermuhle et al., figure 24, wherein element 133 is used to “dispense” chemical on the top of the elongated pillars that are

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parallel i.e., closely aligned to the first direction; see also page 2, column 2, paragraph 44 which discloses numerous chemical moieties that can be deposited on the pillar e.g., antibody/antigen, enzyme/substrate, etc.). Finally, Indermuhle et al. disclose the fabrication of an array of multiple features of different chemical moieties on the substrate surface (e.g., see Indermuhle et al., figure 24 disclosing the array of pillars on the surface wherein various chemicals are spotted on said surface; see also page 2, column 2, paragraph 44; see also figures 2-4; see also page 3, column 2, paragraph 55).

For *claims 5, 30 and 36*, Indermuhle et al. also disclose additionally associating with the array an identification as to the direction of the rows and forwarding the array and associated identification to a remote location (e.g., see figure 24, wherein the identification of the direction of the rows is forwarded to the remote location of the dispenser chip so that the two chips can be properly aligned).

For *claims 6-7, and 34*, Indermuhle et al. disclose “aligning” the housing for the substrate, which may include a wide variety of different dispensers known in the industry (e.g., see page 8, column 2, paragraphs 94-97). Indermuhle et al. further disclose the use of alignment marks or pins (e.g., see page 9, column 2, paragraph 104) and/or the identification of particular shapes like the “rectangular” pins (e.g., see figure 24). Other identifiers are also disclosed including various types of markings (e.g., see page 9, paragraph 105).

Response

11. Applicant’s arguments directed to the above 35 U.S.C. § 102 rejection were fully considered (and are incorporated in their entirety herein by reference) but were not deemed

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persuasive for the following reasons. Please note: that the above rejection has been modified from its original version to more clearly address applicants' newly amended and/or added claims and/or arguments.

[1] Applicants argue, "claim 1 is amended to recite a comparison step in which height uniformity across a first and second directions of a substrate are compared to identify a first direction having higher height uniformity. Further claims 1 and 5 are amended to recite that the first and second directions are both planar to the substrate (i.e., both the directions are in the "x-y" plane of the substrate) ... Indermuhle fails to disclose these newly added claim elements" (e.g., see 4/13/04 Response, page 10, last full paragraph).

[2] Applicants argue that Indermuhle et al. do not disclose two directions that are in the plane because the direction that is parallel to the elongated side of the pillar (i.e., the Z direction) is not in the plane and thus the Examiner has not shown features that are aligned with a direction that is planar to the substrate as currently amended (e.g., see 4/13/04 Response, page 11, especially paragraph 2-4).

This is not found persuasive for the following reasons:

[1] The Examiner contends that Indermuhle anticipates the disputed claim limitations as outlined in the newly amended rejection above.

[2] The Examiner notes that the newly amended rejection above shows that Indermuhle et al. do disclose a first and second direction that are "planar" to the substrate. For example, the top of element 132 in figure 24 displays a rectangle wherein a direction that is parallel to the longer edge of the rectangle (i.e., a first direction, called the x-axis) has a higher height uniformity than a direction that is parallel to the shorter edge of the rectangle (i.e., a second direction, called the

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y-axis). Here, both directions (i.e., the x- and y-axis) are in the plane of the substrate, but the x-axis has higher height uniformity because the top of the rectangular pillar extends almost continuously across the entire length of the substrate. In contrast, the y-axis (or the second direction) extends across many pillars (e.g., nine pillars are shown in the figure), spaces that separate the pillars (e.g., the substrate upon which the pillars rest), and many channel defining walls. Thus, the “height” is less uniform proceeding along the y-axis than the x-axis because the height changes from [1] pillar (i.e., element 132) to [2] space between the pillars (i.e., element 134) to [3] the channel defining wall elements (i.e., element 135). In addition, the first direction (i.e., the x-axis) and second direction (i.e., the y-axis) have been “compared” because the addition of sample is placed only on the “tops” of the pillars (i.e., placement is in the x-direction). That is, Indermuhle et al. did not intend to place the sample along the y-direction because that would lead to the placement of samples in the spaces between the pillars and also on top of the channel defining walls, which would defeat the purpose of making chips with elevated sample surfaces).

Accordingly, the 35 U.S.C. 102 rejection cited above is hereby maintained.

New Rejections and/or Objections

Objections to the Claims

12. Claims 35 and 37 are objected to because of the following informalities:

- A. Claim 35 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 33. When two claims in an application are duplicates or else are so close in content

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that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

B. Claim 37 contain(s) the grammatical error “is communicated is” in the first line. Correction is requested.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1-9 and 27-28, 30, 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Indermuhle et al. (US Patent Application Publication 2001/0036674 A1)

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(Filed on **February 23, 2001**) and Cattell (US Patent Application Publication 2002/0102559 A1)

(Filed on **January 31, 2001**).

For *claims 1-9, 27, 30 and 32-36*, Indermuhle et al. teach all the limitations stated in the 35 U.S.C. 102(e) rejection above (incorporated in its entirety herein by reference), which anticipates claims 1-9, 27, 30, 32-36 and, consequently, also renders obvious claims 1-9, 27, 30, 32-36.

The prior art teaching of Indermuhle et al. differs from the claimed invention as follows:

For *claim 28*, the prior art teaching of Indermuhle et al. differ from the claimed invention by not specifically reciting the use of a “pulse jet” printer. Indermuhle et al. only disclose “inkjet” printers (e.g., see page 12, paragraph 128), but does not mention “pulse jet” even though “inkjet” printers commonly contain “pulse jets.”

For *claims 37-38*, the prior art teaching of Indermuhle et al. differ from the claimed invention by not specifically reciting the use of a computer and/or electronic media in association with the identification.

However, Cattell teaches the following limitations that are deficient in Indermuhle et al.:

For *claim 28*, Cattell (see entire document) teaches “pulse jet” printers (e.g., see Cattell, page 5, paragraph 32).

For *claims 37-38*, Cattell teaches the use of electronic media and computer memory in association with identifiers on the substrate and also the use of remote

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locations (e.g., see Cattell, pages 1-2, paragraph 6; see especially figure 6, elements 410, 480, 504, 510 and 530).

It would have been obvious to one skilled in the art at the time the invention was made to use the pulse jet printers and/or computer/electronic media as taught by Cattell with the pillar chips as taught by Indermuhle et al. because both references teach the use of addressable arrays including arrays of biopolymers on a substrate (i.e., the references represent analogous art). Furthermore, one of ordinary skill in the art would have been motivated to use the pulse jet printers and/or computer/electronic media because Cattell explicitly states that these features allow large amounts of data generated by the arrays to be shared with others (see Indermuhle et al., page 1, paragraph 5, "Furthermore, it would be desirable if later discovered biological function data associated with one or more features of an array could similarly be provided to many end users. The present invention further realizes that when many arrays with the same set of features are provided to many different end users, there is the opportunity for them to discover feature errors or biological function data associated with features which could be advantageously shared with others"). Furthermore, one of ordinary skill in the art would have reasonably expected to be successful because both references teach the use of biopolymer arrays on a chip.

Allowable Subject Matter

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15. Claims 29, 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated any new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon D Epperson whose telephone number is (571) 272-0808. The examiner can normally be reached Monday-Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jon D. Epperson, Ph.D.
July 11, 2004

BENNETT CELSA
PRIMARY EXAMINER

